

## [ Orthopaedics ]

# A Minimally Disruptive Surgical Technique for the Treatment of Osteitis Pubis in Athletes

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**Background:** Multiple surgical procedures exist for the treatment of osteitis pubis: curettage of the symphysis joint, wedge resection, complete resection of the joint, placement of extraperitoneal retropubic synthetic mesh, and arthrodesis of the joint. However, a paucity of literature has reported long-term successful outcomes with the aforementioned approaches. Patients treated operatively have reported recalcitrant pain resulting from iatrogenic instability. The article presents the results of a conservative operative technique that avoids disruption of adjacent ligaments.

**Hypothesis:** Preserving the adjacent ligamentous structures will allow competitive athletes to return to competition and activities of daily living free of iatrogenic pelvic instability and pain.

**Study Design:** Case series.

**Methods:** Four competitive athletes (2 professional and 2 collegiate football players) diagnosed with osteitis pubis were treated conservatively for a minimum of 6 months. Patients underwent surgical intervention upon failure to respond to nonoperative management. The degenerative tissue was resected, allowing only bleeding cancellous bone to remain while preserving the adjacent ligaments. An arthroscope was used to assist in curettage, allowing the debridement to be performed through a small incision in the anterior capsule.

**Results:** The symptoms of all 4 patients resolved, and they returned to competitive athletics. This ligament-sparing technique provided a solid, stable repair and pain relief.

**Conclusion:** This surgical technique preserves the adjacent ligamentous structures and allows competitive athletes to return to competition and activities of daily living free of pain and void of pelvic instability.

**Clinical Relevance:** This technique is a surgical treatment option for athletes with osteitis pubis who fail conservative treatment.

**Keywords:** osteitis pubis; pelvic pain; athletes; symphysis pubis pain; pelvic instability

Osteitis pubis is a painful condition characterized by inflammation of the pubic symphysis and adjacent structures.<sup>21</sup> The cause of osteitis pubis remains uncertain, but it is often associated with urologic, obstetric, gynecologic, and traumatic conditions in the pelvic region.<sup>6,9</sup> It is frequently associated with periosteal trauma, after direct injury or repetitive microtrauma sustained during athletic activity.<sup>1,10,12,18,22,23</sup> In the athletic population, the incidence of osteitis pubis ranges from 0.5 to 7.0%.<sup>19</sup>

Nonoperative management includes rest, ice, physical therapy, adductor muscle strengthening, ultrasonography,

nonsteroidal anti-inflammatories, oral glucocorticoids, and corticosteroid injections directly into the pubic symphysis.<sup>5,8,15,24</sup> However, 5% to 10% of patients fail to respond to nonoperative management.<sup>11</sup> When nonoperative measures fail, operative treatment may be indicated for refractory osteitis pubis.<sup>11,14,24</sup> Operative treatment has included curettage of the symphysis, wedge resection, placement of extraperitoneal retropubic synthetic mesh, and arthrodesis.<sup>3,14,16,18,24</sup> Nevertheless, results of operative treatment remain variable.<sup>24</sup> Patients treated operatively may become unstable and suffer recalcitrant pain.<sup>15</sup> In an effort to alleviate the iatrogenic instability previously

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reported with more extensive operative management, a novel operative technique was developed that maintains the adjacent ligaments. This technique allows arthroscopic verification of the debridement while minimizing soft tissue dissection.

## MATERIALS AND METHODS

### Clinical Findings

The clinical diagnosis of osteitis pubis was based on history, physical examination, and radiographic findings. All the patients had pain at the pubic symphysis during high-demand sports and following activity and positive cross-leg and lateral compression tests, the results of which became negative once the acute inflammation resolved. Inguinal hernias, adductor strains, osteomyelitis, stress fractures, lower abdominal strain, sports hernia, and seronegative spondyloarthritis were in the differential.<sup>2,7,17,19,20</sup> Radiographs demonstrated erosions adjacent to the pubic symphysis, spurring, and subchondral sclerosis (Figure 1). Magnetic resonance imaging (MRI) demonstrated no tendon injuries, but it did reveal bone edema on both sides of the pubic symphysis consistent with a diagnosis of osteitis pubis.

### Nonoperative Treatment

Multiple attempts were made at nonoperative management, including rest, rehabilitation, and steroid injection by computed tomography. Any beneficial effect of nonoperative treatment was transitory; severe pain had either returned to previous levels or worsened. Discomfort and inability to continue athletics ensued, as well as pain with activities of daily living. The indication for surgery was the failure to alleviate symptoms with a minimum of 6 months of nonoperative treatment.

### Operative Treatment

*Preoperatively.* The patients had localized tenderness over the pubic symphysis. No tenderness was noted over the proximal adductors.

*Intraoperatively.* Each patient had a 5- to 7-cm Pfannenstiel incision centered over the pubic symphysis. The skin was sharply incised with the scalpel, down to the intact overlying fascia. The soft tissue was dissected; superficial veins were identified and coagulated; and Camper fascia was dissected. A longitudinal split was made through Scarpa fascia, directly over the pubic symphysis. The fascial attachments of the abdominal muscles were identified. The soft tissue was palpated toward the vas deferens, on both the left side and the right approximately 6 cm from the center of the incision in the midline through the fascia and into the capsule of the pubic symphysis. The pubic symphysis was identified with a spinal needle and a longitudinal incision over the anterior pubic symphysis for the curette and arthroscope. The superior and most inferior aspect of the capsule was intact. A combination



Figure 1. Radiograph demonstrating erosions adjacent to the pubic symphysis, spurring, and subchondral sclerosis.

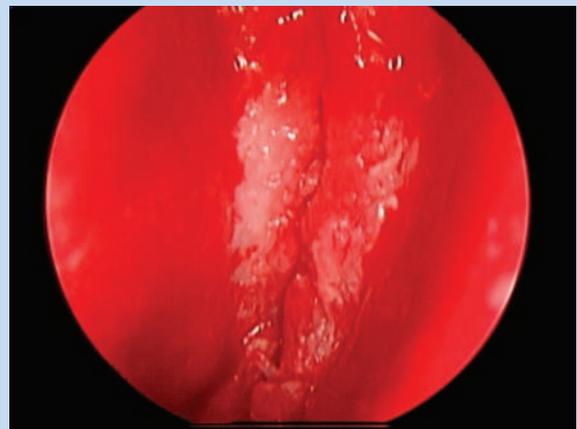


Figure 2. Superior aspect of pubic symphysis predebridement.

of an osteotome and curette was used to free the periosteal attachment from the medial and lateral aspects of the pubic symphysis. The superior, inferior, and posterior ligament anatomy was not disturbed. The fibrous disk, which was soft and appeared degenerative, was immediately identified (Figure 2). A curette and rongeur were used to remove all this fibrous tissue and portions of the articular cartilage margin until there was a bleeding bony bed on either side of the pubic symphysis (Figure 3). The arthroscope was inserted into the joint to verify that all cartilage material had been removed while leaving the superior, inferior, and posterior pubic ligaments intact. The capsule was then repaired with a 2-0 PDS (polydioxanone) suture (Figure 4). Scarpa fascia was then repaired with a 0 PDS suture and Camper fascia with a 2-0 PDS suture (Figure 5).

*Postoperatively.* Patients were advised to ambulate with crutches, weightbearing as tolerated with a 2-crutch 4-point

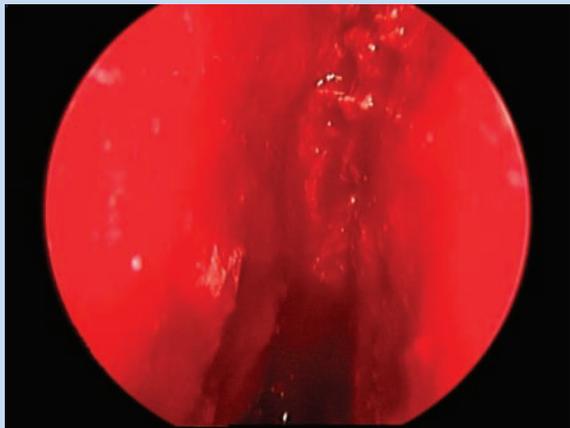


Figure 3. Pubic symphysis debridement.

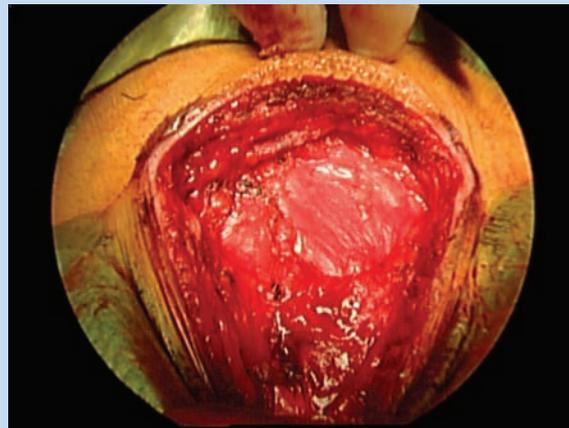


Figure 5. Closure of Camper fascia.

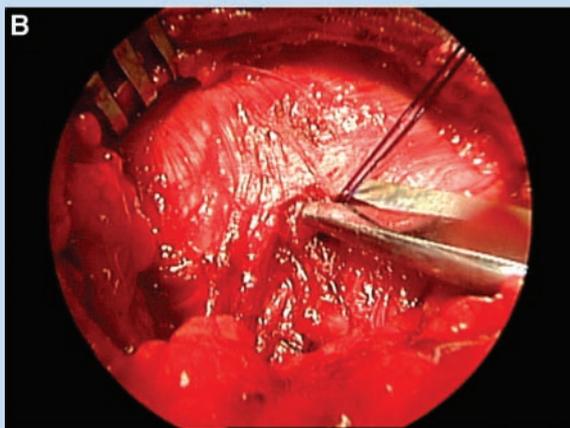
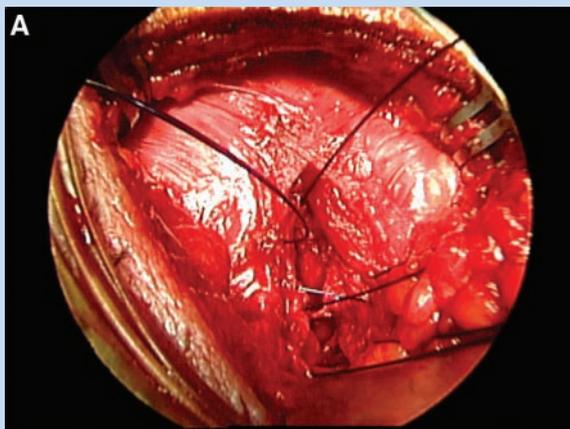


Figure 4. Closure of capsule.

gait for 3 weeks. Deep friction massage was prescribed and ice was used to decrease sensitivity. Pool exercises were initiated at 4 weeks. Lower body and abdominal strengthening were added at week 6, followed by running

at week 8. The athletes were allowed to return to activity as long as they remained asymptomatic.

## RESULTS

The mean age of the patients at the time of operation was 22.4 years (range, 20 to 26 years), with a mean duration of symptoms of 10 months (range, 6 to 13 months). Patients resumed light activity at 2 months (range, 2 to 3 months) postoperatively. The mean time to return to play was 3 months (range, 2 to 8 months). All patients returned to the same level of activity. The mean follow-up from date of surgery to most recent outcome assessment was 50 months (range, 47 to 52 months).

### Clinical Findings

No complications occurred. All patients were satisfied with the results and returned to play asymptomatic. At most recent follow-up, patients reported no use of analgesics and a full, symmetric, bilateral hip range of motion, free of apprehension. Muscle bulk and tone were symmetric. Palpation over the pubic symphysis, compression of the iliac wing, and resisted thigh adduction were asymptomatic. Pain was no longer elicited at the limits of hip abduction.

### Radiographic Findings

Postoperative radiographs were obtained at 4 and 8 weeks to confirm the absence of heterotopic bone formation.

### Pathologic Findings

Each patient had intraoperative specimens obtained for pathologic analysis. Specimens were remarkably similar in all patients. They consisted of chronic nonspecific inflammatory tissue composed of plasma cells and lymphocytes. Areas of fibrosis and focal cartilaginous metaplasia were also common. Acute inflammatory reactions were not evident. Results of all tissue cultures were negative.

## DISCUSSION

Osteitis pubis most often resolves spontaneously with adherence to conservative treatment management.<sup>24</sup> However, even the most compliant patients remain, on occasion, resistant to nonoperative measures. A review of the literature for operative management of osteitis pubis reveals multiple options, including curettage, wedge resection, arthrodesis, and application of a retropubic synthetic mesh.<sup>11,16</sup> Curettage is the most straightforward, but the results have been suboptimal at best in the athletic population.<sup>11</sup> In the largest series in the literature, Radic and Annear<sup>8</sup> looked at the results of curettage in athletes, reporting that only 14 of 23 (61%) returned to full athletic participation. In addition, only 69% surveyed postoperatively (at a mean follow-up of 24 months) were satisfied with the procedure and thought it was worthwhile. These results indicate that a substantial group (30% to 40%) was unsatisfied after curettage alone and remained unable to perform.

In 1961, Schnute described a wedge resection for the treatment of osteitis pubis.<sup>21</sup> In 1989, Grace et al reported results of 10 women with an average age of 51 years and recalcitrant osteitis pubis secondary to obstetric and gynecologic causes.<sup>4</sup> Their surgical approach involved cutting a wedge of bone 5 mm wide on each side of the symphysis joint anteriorly and 2 cm posteriorly. The rationale was that preservation of the arcuate (inferior) ligament would provide enough strength to maintain pelvic stability. However, 3 patients were not satisfied with their results: 2 had recurrent anterior pelvic pain with groin clicking and 1 required bilateral sacroiliac arthrodesis for pain caused by posterior instability. Results of wedge resection in athletes have not been reported. Moore et al described 2 patients with late posterior instability of the pelvis after wedge resection; both cases required bilateral sacroiliac arthrodesis and fusion of the symphysis pubis.<sup>13</sup> There may be a late risk of posterior pelvic instability with resection procedures if adjacent ligaments are violated. The risk of posterior pelvic instability in a high-demand athletic population would be unacceptable.

Internal fixation of pubic diastasis secondary to acute trauma is well described.<sup>3</sup> The use of a bone graft to supplement plate fixation and effect arthrodesis of the pubic symphysis has been described in relation to chronic pain secondary to parturition and pelvic injury.<sup>9</sup> Moore et al recommend arthrodesis of the pubic symphysis, with a conservative approach postoperatively, in patients with recalcitrant osteitis pubis.<sup>13</sup> Symphyseal instability was not a factor. Williams et al have the largest reported series of pubic symphysis arthrodesis in athletes.<sup>24</sup> Seven rugby players failed 13 months of conservative treatment for osteitis pubis and were treated with a 4-hole dynamic compression plate augmented by a tricortical iliac crest autograft. All 7 fused and reported playing rugby without pain at 4 years follow-up. Complications included intermittent scrotal swelling (which resolved over 6 months) and hemospermia (for 6 weeks). The return to play in this group was 7 months, longer than previously reported.<sup>24</sup>

Recently, Paajanen et al described a retropubic mesh technique to treat recalcitrant osteitis pubis.<sup>16</sup> The standard 3-trochar technique of laparoscopic-assisted hernia repair was used in 5 high-level athletes (soccer players and cross-country skiers). A 10- × 15-cm polypropylene mesh (Prolene; Ethicon Inc) was placed in the preperitoneal retropubic space. All athletes returned to full activity by 8 weeks. The theoretic advantage of this technique is the mesh support to the conjoint tendon and the posterior pubic symphysis. The preperitoneal technique minimizes postoperative pain and requires only 3 small incisions for the introduction of trocars. The initial results of this operation are encouraging.<sup>16</sup>

The advantage of preserving the ligaments is to reduce the risk of developing posterior pelvic instability, which could be career threatening for the athlete. This technique allows arthroscopic confirmation of the adequacy of the debridement, as well as visualization of the pubic cancellous bones.

There are limitations to consider with this series. At 6 months, the period of nonoperative management in these patients was shorter than that cited in the literature. Many clinicians recommend 1 full year of conservative treatment before considering surgical intervention.<sup>24</sup> Williams et al<sup>24</sup> suggested that surgery be considered when both the surgeon and the patient agree that conservative measures have failed. Lack of a control group prevents comparison with the natural history of the recalcitrant osteitis pubis in athletes. Additionally, the small sample size makes it challenging to draw definitive conclusions.

## CONCLUSION

The majority of patients with osteitis pubis should be managed nonoperatively. Operative management should be considered when conservative treatment fails. This procedure was performed in well-motivated professional (n, 2) and collegiate (n, 2) football players with pathogenesis related to athletic activity. It may be applicable to additional patients with recalcitrant osteitis pubis. This technique was effective in relieving pain and restoring function in these 4 patients.

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